

Elections, Recession Expectations and Excessive Debt:

An Unholy Trinity

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In the literature, it has been suggested that recession expectations augment the political budget cycle. This paper argues theoretically that opportunistic policymakers expecting a recession during an election year allow the primary deficit to increase even more when the stock of debt is very high, but reduce the deficit by more during an expected boom (also in an election year). The finding is robustly supported by evidence from Portuguese municipalities. Plots of average marginal effects for the election year show that the difference between high and low debt municipalities grows for more pronounced expectations of recessions as well as booms.

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I INTRODUCTION

It is seen as a stylized fact that political budget cycles (PBCs) are context-conditional, i.e. they do not occur in all countries or under all circumstances. Early on it was argued that they are more likely to appear in specific country groups (developing countries, Schuknecht, 1996; or new democracies, Brender and Drazen, 2005). Then the emphasis shifted to country characteristics like fiscal intransparency (Alt and Lassen, 2006) or the electoral system (Aidt and Mooney, 2014). Veiga, Veiga and Morozumi (2017) confront several of these conditioning factors and find that media freedom is key in reducing the incidence of PBCs. Bohn and Veiga (2017) shift the focus to the economic conditions and present evidence which shows that recession expectations augment the political budget cycle.

This paper deepens the analysis of the effect of economic conditions on the PBC. It argues that entities (e.g. countries, municipalities) with a high stock of debt may end up with a higher primary deficit in an election year than those with lower initial debt when a recession is expected (and vice versa for expected booms). This is relevant for two reasons. First, high debt entities frequently face recessions. Second, the high deficit outcome may seem surprising because high debt entities are often pressured, if not obliged, to raise tax or other revenues and cut expenditures in order to produce a primary surplus or, at least, to dramatically decrease their primary deficit (for instance, in order to reach a pre-set debt target). During a recession this may not be easy. It may also not be desirable; standard Keynesian countercyclical policy may be used to alleviate the macroeconomic consequences of the recession. However, the effort to improve the primary balance should be at least as strong in entities with a high stock of debt as in other entities. In fact, this is the (normal) government response to a high stock of debt in an expected recession in an off-election year. But why then the higher primary deficit in high debt entities when a recession is expected in an election year?

Our answer is very simple and we illustrate it in an opportunistic PBC model which incorporates boom and recession expectations. Our model shows that an opportunistic policymaker is immune against debt targets (including a potential reputation loss) when a recession is expected for an election year. Instead, such a policymaker is concerned about her electoral prospect which improves if voters can be made to believe in her competence which, in turn, depends on whether the policymaker is able or not to raise public services or expenditures by more than what was expected by voters. If that is so, the higher primary deficit in a high debt entity (in an election year when a recession is expected) is entirely due to the fact that a government of a highly indebted entity typically has to employ higher tax rates and, therefore, loses more tax revenue during a recession. To undo that loss, and still appear competent, an opportunistic policymaker of a high debt entity has to accept a higher deficit. The opposite argument holds for expected boom times; an opportunistic policymaker can now plan on using the higher tax revenues to reduce debt without losing re-election chances.

Our logic works when excessive debt coincides with higher tax rates. But that is not guaranteed. In fact, excessive debt may have been produced because tax rates were too low in the first place. Eventually, excessive debt entities will have to apply high tax rates to tackle the debt problem. It may be difficult to judge whether an entity is still in the rapid debt accumulation/low tax rate phase or in the excessive debt/high tax rate phase. This is so because it is not at all obvious what high tax rates are. At a country level, for instance, tax rates depend on specific factors like the development of the tax system, the cost of tax enforcement (which depends, for instance, on the share of the agricultural sector in total output), or the willingness and ability of policymakers to use seigniorage.¹ At a sub-national level, samples tend to be more coherent, i.e. there are

¹ At the country level, it is also very difficult to determine when debt is excessive. First, we would not be able to avoid having to define excessive debt in an ad-hoc way. For most countries, there are no legal public debt limits. Even if they exist, they are typically not binding. The EU fiscal rules, for instance, did establish a limit of 60% of GDP for the gross public debt of member countries, but it was not binding for entering the Eurozone and only received greater importance with the changes in the

similar tax rates and similar responses to excessive debt, especially if there are excessive debt procedures. The Portuguese municipal data employed in this paper satisfies these conditions. We do not have tax rate data for most of our sample period, but we discuss in footnote 18 and show in the appendix that fiscal revenues are higher in high/excessive debt municipalities.

The empirical results, obtained for a sample composed of all Portuguese municipalities covering the period 2002-2014, robustly confirm the intuition that our model suggests. Based on our regression results, we illustrate the change of policy in election years with plots of average marginal effects for the election year, over forecasted growth rates. Those marginal effect plots show higher primary deficits in high debt municipalities during expected recession times and lower primary deficits during expected boom times (compared to low debt municipalities). The difference grows for expectations of more vicious recessions as well as for expectations of more pronounced booms.

Our result extends the discussion of context-conditionality of political budget cycles. It shows that excessive debt, if paired with high tax rates, produces even stronger PBCs during recessionary periods. It captures an important mechanism with significant policy implications. In particular, it says that it may even be counterproductive to prescribe a tough medicine (higher tax rates), if the excessive debt entity faces frequent elections during recessionary periods. Another interpretation relates to the role of constraints for the emergence of political budget cycles. Streb, Lema and Torrens (2009) discuss checks and balances that serve as institutional constraints for reducing political budget cycles. This paper argues that the existence of a low debt level is by itself a constraint that limits political budget cycles (at least during recessionary periods).

rules after the sovereign debt crisis. Second, high debt is less problematic when public debt is held by domestic residents than by foreign residents. Third, debt issued in national currency is less problematic than debt denominated in foreign currency. Fourth, while countries that control their monetary policy have the possibility to monetize debt, those which are members of a monetary union like the Eurozone cannot do so individually.

We emphasise recessions and excessive debt as conditioning factors in the paper, but other conditionalities may also play a role (see reviews by Franzese, 2002, and de Haan and Klomp, 2013). First, we focus on the aggregate level of fiscal policy in terms of the primary deficit, but not on particular types of expenditures.² In a robustness test we also present results for total expenditures and fiscal revenues. Footnote 19 explains why they give clues in the direction of the results we obtain for primary deficits. Second and consequently, we do not account for fiscal conservatism. Given that we find a significant PBC effect, there is arguably no overall fiscal conservatism as suggested by Pelzman (1992).³ We can, however, not exclude the possibility that the PBC effect occurs because policymakers manipulate certain types of expenditures (which we do not distinguish in the paper) in favour of some key groups of voters.

Our theoretical model, too, does not distinguish between different types of expenditures or voters. It also presupposes that voters do not behave fiscally conservative, either because they do not want to or because the manipulation is so effective that it overcompensates any fiscal conservative predisposition. The opportunistic political budget cycle model we use implicitly assumes that voters, if rational or not, can actually be made to believe in the higher competence of the incumbent based on fiscal manipulations. It was Rogoff and Sibert's (1988) and Rogoff's (1990) idea that utility-maximising voters should only be concerned about the competence of the policymaker chosen for governing after the elections. If competence shocks are persistent (usually modelled as MA(1) shocks), the task of voters becomes a competence extraction task in order to decide on who to vote for. However, even rational voters can be fooled, if there is some information

² The notion of cycles in various types of public expenditures is supported by, for instance, Schuknecht (2000; capital expenditures), Drazen (2001; transfers), Block (2002, visible current expenditures) and Vergne (2009; subsidies). Cycles in the composition of expenditure are also suggested, for instance, by Veiga and Veiga (2007), Drazen and Eslava (2010), Schneider (2010) and Aidt and Mooney (2014).

³ And empirically supported by Hayo and Neumeier (2017, for Germany), Drazen and Eslava (2010, for Colombia), and Brender and Drazen (2008, for a panel of countries). However, Veiga and Veiga (2007) and Aidt, Veiga and Veiga (2011) show that there is no fiscal conservatism in Portuguese municipal voting.

asymmetry. In Rogoff’s world, politicians observe their competence skills before voters; hence we obtain a signalling model. In the Lohmann (1998) and Shi and Svensson (2006) world, some part of the electorate is uninformed or has some other handicap (in Bohn and Veiga, 2017, it is inertial growth perceptions). It is important, however, that politicians cannot observe their competence shocks. Hence there is no signalling; instead, the incumbent will exert some hidden effort to manipulate the outcome of the elections. Our model is in this latter pure moral hazard tradition.

The paper is structured as follows. Section II lays out the model. Indications on the solution and the main results can be found in Section III. Section IV describes the data, the institutional setting, and the empirical model. Section V presents empirical evidence (including the results of robustness tests) providing support for the main implications of the theoretical model. Section VI concludes.

II MODEL

The model combines elements from Lohmann (1998), Shi and Svensson (2006) and Bohn and Veiga (2017). It captures an economy with n voters and two opportunistic candidates, an incumbent and a challenger, who compete for holding office every alternate period. Each agent’s expected utility depends on the discounted present value of expected period utilities which, in turn, consist of additively-separable economic and political utilities (β is the discount factor; E is the expectations operator). In each period, voters derive utility from consumption c ($u(c_s)$ has the standard concavity properties), from local public goods L and from political utility $\theta^i z_s$ (with weight α). Voter i ’s ideological preference or personal sympathy, θ^i , is uniformly distributed over the interval $[-1,1]$; z indicates who is in power ($z_s = -\frac{1}{2}$, if a is in power; $z_s = \frac{1}{2}$, if b is in power; without limiting the generality of the analysis we call a the incumbent and b the challenger). If her favourite candidate is in power, voter i receives positive political utility; political

utility is smaller for more moderate voters, i.e. voters with less strong views on the candidates. Voters vote prospectively in that they choose the candidate who can deliver the highest expected utility in the future. More moderate voters might, therefore, vote for the "wrong" candidate, if they are compensated by higher economic utility. Here is the voters' utility function:

$$U_t^i = \sum_{s=t}^{\infty} (\beta^i)^{s-t} E_t[u(c_s) + L_s + \alpha\theta^i z_s]; \quad s = t, t+1, \dots; \quad i = 1, \dots, n. \quad (1)$$

The candidates' economic utility is the same as voters'. However, candidates only receive a political (dis-)utility if they are in office: an ego rent and a potential reputation loss, if they were also responsible for missing pre-set debt target B_{s-1}^* (see further down) in the previous year:

$$V_t^j = \sum_{s=t}^{\infty} W_s^j = \sum_{s=t}^{\infty} (\beta^j)^{s-t} E_t[u(c_s) + L_s + \mathbf{I}_s X_s - \mathbf{I}_{s-1} \mathbf{I}_s \xi_s (B_{s-1}^* - B_{s-1})^2]; \quad (2)$$

$$s = t, t+1, \dots; \quad j = a, b; \quad \mathbf{I}_r = \begin{cases} 1 & \text{if in power in period } r; \\ 0 & \text{otherwise.} \end{cases}$$

Everybody's expected consumption depends on expected after-tax income:

$$E_t^k[c_s] = E_t^k[(1 - \tau_s)\epsilon_s \bar{y}] = (1 - \tau_s)\epsilon_s, \quad k = j, i. \quad (3)$$

τ_s is the tax rate. Period-specific expected growth factor shock ϵ_s captures the deviation from trend (or previous period or potential) output \bar{y} which is normalised to 1; $\epsilon_s > 1$ is an expected boom; and $\epsilon_s < 1$ is an expected recession.

The government budget constraint relates primary deficit D_s to the provision of (local) public goods L_s . It takes into account expected tax revenue $\tau_s \epsilon_s$ and the government's competence η_s^j (see further down):

$$L_s = \tau_s \epsilon_s + D_s + \eta_s^j. \quad (4)$$

Excessive debt municipalities are obliged to reduce their debt by a certain percentage every year and may have to apply a particularly high tax rate. Low debt municipalities do not have such requirements. In a continuous setting, we capture it with two continuous functions. Here is every municipality's yearly (period-specific) debt target B_s^* (which depends on the initial level of debt B_{t-1}):

$$B_s^* = \delta B_{s-1}^*, \quad s = t, t+1, \dots ; \text{ with } B_{t-1}^* \equiv B_{t-1}; \quad (5)$$

$$\delta = \delta(B_{t-1}^*); 0 < \delta \leq 1 \text{ for } B_{t-1}^* \geq 0;$$

$$\delta(0) = 1 \text{ and } \delta \text{ monotonously decreasing.}$$

For the municipalities' tax rate τ_s we assume that it is predetermined and – as argued before – depends on the initial level of debt B_{t-1} , too:

$$\tau_s = \tau = \tau(B_{t-1}); \quad \text{with } \tau' > 0; \tau'' < 0. \quad (6)$$

Given the interest payment on inherited debt level B_{s-1} from the previous period, and, possibly, debt reduction from B_{s-1} to target level B_s^* the government would normally be obliged to make a primary surplus. Let's call it the primary surplus requirement (component 1) which would imply $D_s < 0$ and require spending cuts. However, the government may choose to disregard the rules, especially in an election year, and maximise with respect to the second component, the freely choosable deficit D_s^{free} .

$$D_s \equiv (B_s - B_{s-1}) - rB_{s-1}.$$

$$D_s = ((B_s^* + D_s^{free}) - B_{s-1}) - rB_{s-1};$$

$$= \underbrace{(B_s^* - B_{s-1}) - rB_{s-1}}_{\text{primary surplus requirement}} + \underbrace{D_s^{free}}_{\text{freely choosable}} ;$$

$$= \delta B_{s-1}^* - (1+r)B_{s-1} + D_s^{free}. \quad (7)$$

As in Rogoff (1990), government competence is modelled as an MA(1) process. However, Shi and Svensson (2006) suggested that there are always new tasks which do not allow candidates to know their own competence η_s^j in advance:

$$\eta_s^j = \mu_s^j + \mu_{s-1}^j. \quad (8)$$

Shocks μ_t^j are random variables with mean 0 and distribution function $F[\mu_t^j] = F[\bullet]$. For simplicity, density function $f[\mu_t^j] = f[\bullet] = F'[\bullet]$ is assumed to be bell-shaped, but more general formats would also be possible. Inserting equations (6) to (8) into budget constraint (4) we obtain:

$$L_s = \tau_s \epsilon_s + D_s + \mu_s^j + \mu_{s-1}^j; \quad (9)$$

$$= \tau(B_{t-1})\epsilon_s + \delta B_{s-1}^* - (1+r)B_{s-1} + D_s^{free} + \mu_s^j + \mu_{s-1}^j. \quad (10)$$

TABLE I: THE TIMING OF EVENTS

Time	Who does what?
Period t	<p>1) Voters i and incumbent a observe:</p> <ul style="list-style-type: none"> - the incumbent's last period skills μ_{t-1}^a; - the predetermined tax rate τ_t. <p>2) Incumbent a observes:</p> <ul style="list-style-type: none"> - the temporary debt target B_t^*; - growth (estimate) ϵ_t. <p>3) Incumbent a:</p> <ul style="list-style-type: none"> - chooses primary deficit D_t; - thereby providing local public goods L_t. <p>4) Voters i observe:</p> <ul style="list-style-type: none"> - local public goods L_t. <p>5) Voters i:</p> <ul style="list-style-type: none"> - form expectations of the incumbent's current period skills $\widehat{\mu_t^a}$; - and vote.
Period t+1	The winner of the period t elections takes office, receives an ego rent and suffers a reputation loss, if she missed debt target B_t^* .

The timing of events is presented in Table I. Elections take place in alternating periods. At the beginning of election period t , voters and incumbent a observe the realisations of last period's skills shock μ_{t-1}^a and predetermined current period tax rate τ_t . The incumbent also observes (period-specific) debt target B_t^* and growth shock ϵ_t which allows her to decide on the optimal level of freely choosable deficit D_t^{free} .⁴ On this basis, the government determines the choice of primary deficit level D_t , thereby providing quantity L_t of local public goods. Voters observe L_t and form expectations of skills shock, $\widehat{\mu}_t^a$, which is, however, affected by their expectations of the growth shock, $\widehat{\epsilon}_t$, and of the primary deficit, \widehat{D}_t . Voters base their decision on whether to vote for the incumbent on $\widehat{\mu}_t^a$ because period t skills affect the incumbent's competence for providing local public goods in $(t+1)$. Note that voters can make a mistake in their expectation of the incumbent's competence for two reasons: (i) they may not be able to fully anticipate the deficit policy by the incumbent; and (ii) they may not be able to fully anticipate an imminent economic slump or boom.

In period $(t+1)$, the winner of the election receives ego rent X . Policy in $(t+1)$ is no longer dependent on voting though; hence either policymaker (a or b) will repay the costly debt as much as possible, thereby cutting the provision of local public goods.⁵ Voters anticipate this, but can do nothing to prevent it. Note also that the voting decision in election period t does not extend to considering expected utility in $t+2$

⁴ Voters may or may not observe the debt target and the growth shock (whereas policymakers are assumed to observe the growth shock correctly). The model is silent (and this does not affect the qualitative results) on whether their beliefs of expected growth $\widehat{\epsilon}_t$ and expected primary deficit \widehat{D}_t are determined on the basis of full or partial information, rationally or not. Those beliefs affect voters' expectations of the incumbent's current period skills $\widehat{\mu}_t^a$, but the incumbent can only take them as given values when choosing her optimal policy.

⁵ We do, however, assume that the government never goes below the period-specific debt target. B_{t+1}^* is, therefore, both the lower limit and the relevant debt target for period $(t+1)$. Theoretically, it could namely be optimal to strategically reduce the debt level even further in order to have more room of maneuver in the next election period $(t+2)$, although behaviour of this kind may seem unrealistic, especially when the stock of debt is very high. By assuming the debt target to also be the lower limit for debt reduction we follow Shi and Svensson (2006); they also rule out strategic behaviour by not allowing the government to produce negative debt.

because the MA(1) nature of the competence process makes incumbent and challenger indistinguishable then. Policymakers do also not include $t + 2$ in their optimisation problem when determining the optimal level of D_t^{free} because they cannot influence their own utility or boost their re-election chances in $t + 2$. Hence the model can be split into cycles of two periods which consist of election period t and off-election period $(t + 1)$.

III MODEL SOLUTION

Given the timing of events and the reasoning for splitting the analysis into 2-period election cycles the solution is found by studying the incumbent's utility maximisation over the cycle including election period t and off-election period $(t + 1)$. Whether the incumbent receives an ego rent in period $(t + 1)$ depends on the probability of being elected which, in turn, depends on her election year choice of the optimal level of deficit D_t , which ultimately depends on the choice of freely choosable deficit D_t^{free} . The logic of the model solution is explained here, but details are provided in the appendices. Voters base their voting decision in period t on a comparison of utilities to be expected from the incumbent and the challenger in period $(t + 1)$. Utility expected from the provision of local public goods in $(t + 1)$ is affected by the policymakers' competence ($\eta_{t+1}^j = \mu_{t+1}^j + \mu_t^j$) and individuals' expectations thereof. Since competence is an MA(1) process, incumbent a 's period t choice of D_t^{free} affects what voters expect of the incumbent's competence in period $(t + 1)$, whereas nothing is known about the challenger. In Appendix A we derive an (in our opinion, realistic) condition for a voter to vote for the incumbent which was already hinted at when explaining equation (1). If the voter shares the incumbent's ideology and the incumbent is expected to do at least an equally good job ($E_t^i[\mu_t^a] \geq E_t^i[\mu_t^b] = 0$) or if the voter has a different ideology (though not too far on the other side of the political spectrum) and the incumbent does a great job, then the voter

will vote for the incumbent:

$$E_t[\mu_t^a] > \alpha\theta^i. \quad (11)$$

On this basis, the individual's probability to vote for the incumbent can be derived (see the end of Appendix A). The probability for the incumbent to win the election is, therefore:

$$\text{Prob} \left\{ \left[\frac{E_t[\mu_t^a]}{2\alpha} + \frac{1}{2} \right] \geq \frac{1}{2} \right\}. \quad (12)$$

Voters extract government competence μ_t^a by using the government budget constraint (9). The true competence is:

$$\mu_t^a = L_t - \tau_t \epsilon_t - D_t - \mu_{t-1}^a. \quad (13)$$

Voters can observe the level of local public goods L_t , the tax rate τ_t , and previous period competence μ_{t-1}^a . Their perception of government competence is, however, also affected by their expectation of growth and the government deficit policy. Using equation 13 (see Appendix B) the perception of competence $E_t[\mu_t^a]$ can be expressed as:

$$E_t[\mu_t^a] = \widehat{\mu}_t^a = L_t - \tau_t \widehat{\epsilon}_t - \widehat{D}_t - \mu_{t-1}^a = \mu_t^a + [\tau_t(\epsilon_t - \widehat{\epsilon}_t)] + [D_t - \widehat{D}_t]. \quad (14)$$

Note that voters overestimate the incumbent's competence ($\widehat{\mu}_t^a > 0$), if the government can raise the primary deficit above what is expected by voters. This is the standard manipulation argument. However, if they think the recession is less severe than it actually is, they underestimate the incumbent's competence.

Let us now rewrite the incumbent's probability of winning (12):

$$\begin{aligned} \text{Prob}^{win} &= \text{Prob} \left\{ \left[\frac{\mu_t^a + [\tau_t(\epsilon_t - \widehat{\epsilon}_t)] + [D_t - \widehat{D}_t]}{2\alpha} + \frac{1}{2} \right] \geq \frac{1}{2} \right\} \\ &= 1 - F[\tau_t(\widehat{\epsilon}_t - \epsilon_t) + \widehat{D}_t - D_t]. \end{aligned} \quad (15)$$

If we assumed rational expectations, there could not be any manipulation in the equilibrium and the probability of winning could not be increased (despite the government's best efforts in doing so; as seen in first order condition 17). Under other behavioural assumptions for voters' expectations, the probability of winning can be affected by the incumbent's choice. For the core result of the paper it does not matter, if the winning probability can be affected or not. We, therefore, take an agnostic point of view at this stage, but will discuss the effect of voters' assumptions when discussing Lemma 1 and Proposition 1 further down.

The incumbent's 2-period maximisation problem can now be written as follows (see end of Appendix B and Appendix C; X_s is kept constant and discount factor β is set to 1 because it is irrelevant for the qualitative properties of the results):

$$\begin{aligned}
max_{D_t^{free}} \quad & E_t^a \{ u((1 - \tau)\epsilon_t) + L_t + X \} \\
& + E_t^a \{ \text{Prob}^{win} [u((1 - \tau)\epsilon_{t+1}) + L_{t+1} + X - (B_t^* - B_t)^2] \} \\
& + E_t^a \{ (1 - \text{Prob}^{win}) [u((1 - \tau)\epsilon_{t+1}) + L_{t+1}] \}; \tag{16}
\end{aligned}$$

where $L_t = \tau\epsilon_t + D_t + \eta_t^j$;

$$L_{t+1} = \tau\epsilon_{t+1} + (\delta^2 - (1 + r)^2)B_{t-1}^* - (1 + r)D_t + \eta_{t+1}^j;$$

$$D_t = (\delta - (1 + r))B_{t-1}^* + D_t^{free}.$$

The first order condition (FOC) determines the government's optimal choosable deficit

D_t^{free*} (because the second order condition for an optimum is satisfied):

$$\frac{dV}{dD_t^{free}} = 1 - (1 + r_t) + F'[\tau(\widehat{\epsilon}_t - \epsilon_t) + \widehat{D}_t - (\delta - (1 + r))B_{t-1}^* + D_t^{free}]$$

$$[X - (\delta B_{t-1}^* - B_t)^2] = 0;$$

$$\Leftrightarrow r_t = F'[\bullet] [X - (\delta B_{t-1}^* - B_t)^2]. \quad (17)$$

The FOC is straightforward. The interest rate (which is the net marginal loss from incurring a deficit) must be equal to the net marginal gain from increasing the winning chances. The latter is the net benefit for the government (ego rent minus reputation loss) times the marginal increase in winning chances due to the increase in voter-perceived government competence which is caused by the increase in deficit-financed public goods.

As the FOC defines the equilibrium for any expected growth rate ϵ_t , we can now study the effect of (reduced or aggravated) boom or recession expectations:

Lemma 1. - *Growth Expectations.*

Imminent boom expectations (higher ϵ_t in equation 16) decrease the government's choosable optimal deficit D_t^{free*} as well as the overall primary deficit D_t at the equilibrium. (Recession expectations raise it.)

$$\begin{aligned} \text{(i)} \quad & \frac{dD_t^{free*}}{d\epsilon_t} = -\tau(B_{t-1}^*)\epsilon_t < 0; \\ \text{(ii)} \quad & \frac{dD_t}{d\epsilon_t} = \frac{d[(\delta - (1 + r))B_{t-1}^*]}{d\epsilon_t} + \frac{dD_t^{free*}}{d\epsilon_t} = 0 - \tau(B_{t-1}^*)\epsilon_t < 0. \end{aligned}$$

Proof: Appendix D.

The lemma says that there is a countercyclical policy effect in election years. An opportunistic government will compensate the tax revenue shortfall due to the recession by an equal increase in the deficit. Conversely, an opportunistic government can reduce the

deficit by the amount of additional tax revenue. The motivation is clear, the government does not give voters reason to believe that it would not be able to provide the same amount of public goods as without a recession or a boom. Recall that the optimal choice of public goods and hence of the deficit is already elevated as documented by the first order condition. The lemma only says that the government does not want to take any hit to the competence perceived by voters.

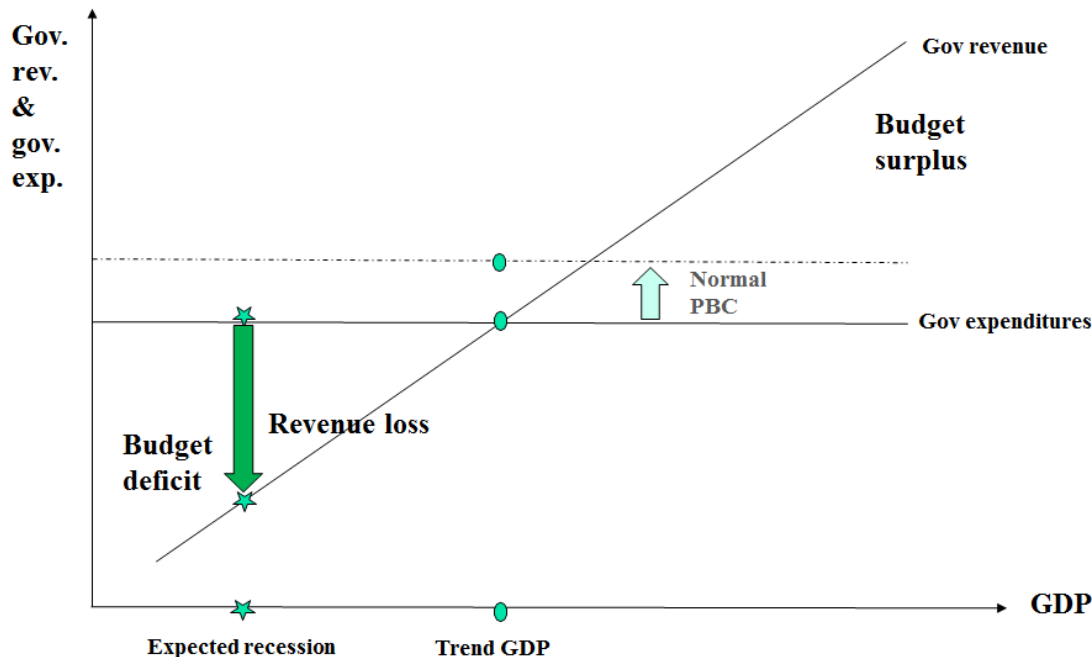


FIGURE I: EXPENDITURE AND REVENUE

Lemma 1 can be illustrated in a stylized situation. Figure I captures a balanced budget situation, if output is at trend level. Situations to the left produce a budget deficit, those to the right a budget surplus. This is so, because we assume that revenues are given by an upward sloping straight line which is purely determined by economic activity. For simplicity, there is no countercyclical (Keynesian) response to recessions. Government expenditures do not respond to output; the government can only change expenditures discretionarily. Given that set-up, Lemma 1 simply says that an opportunistic government which expects a recession will not content itself with the "Normal PBC" (light

[green] arrow) because it expects a revenue shortfall of the size of the dark [green] arrow. It will, therefore, plan on compensating the revenue shortfall by increasing the deficit so that the no-recession level of manipulated government services can be provided despite the expected recession (in order to appear competent). The overall manipulation will be the sum of both arrows.

It is important to note that the result of precisely compensating for the tax revenue shortfall was obtained on the basis of given voter expectations for growth, $\hat{\epsilon}_t$, and deficit, \widehat{D}_t . If, for instance, voters were to expect a smaller recession than the government, then the government would think that it is harder to convince voters of its competence. Hence the manipulation and the countercyclical policy effect would be increased. If, however, voters believed that the government would raise the deficit by less than the tax revenue shortfall, then it would actually be possible for an opportunistic government to increase the deficit by less. Hence less manipulation would suffice and the countercyclical policy effect would be reduced. Analogous arguments could be made for expected booms. The factors determining the magnitude of the countercyclical policy effect were already studied by Bohn and Veiga (2017).

The focus of this paper is on how the countercyclical policy effect is affected by the level of pre-existing debt:

Proposition 1. - *Excessive Debt.*

An increase in excessive debt augments the effect of growth expectations at the equilibrium.

$$\frac{d \frac{dD_t}{d\epsilon_t}}{dB_{t-1}^*} = -\tau'(B_{t-1}^*)\epsilon_t < 0.$$

Proof: Appendix D.

The proposition says that opportunistic policymakers in entities with a high initial stock of debt will choose higher deficits in expected recessions and lower deficits in expected

booms compared to entities with lower debt levels, when they face an election. The proposition is a direct result of the countercyclical policy effect derived in Lemma 1, together with equation (6), which is, admittedly, a simple, but also a very plausible assumption, namely that tax rates are higher in high debt entities. Even if the countercyclical policy effect were reduced for one of the aforementioned reasons, Proposition 1 would still hold. It captures the testable prediction that highly indebted entities manipulate fiscal policy, in particular the deficit, more than entities with lower initial debt levels.

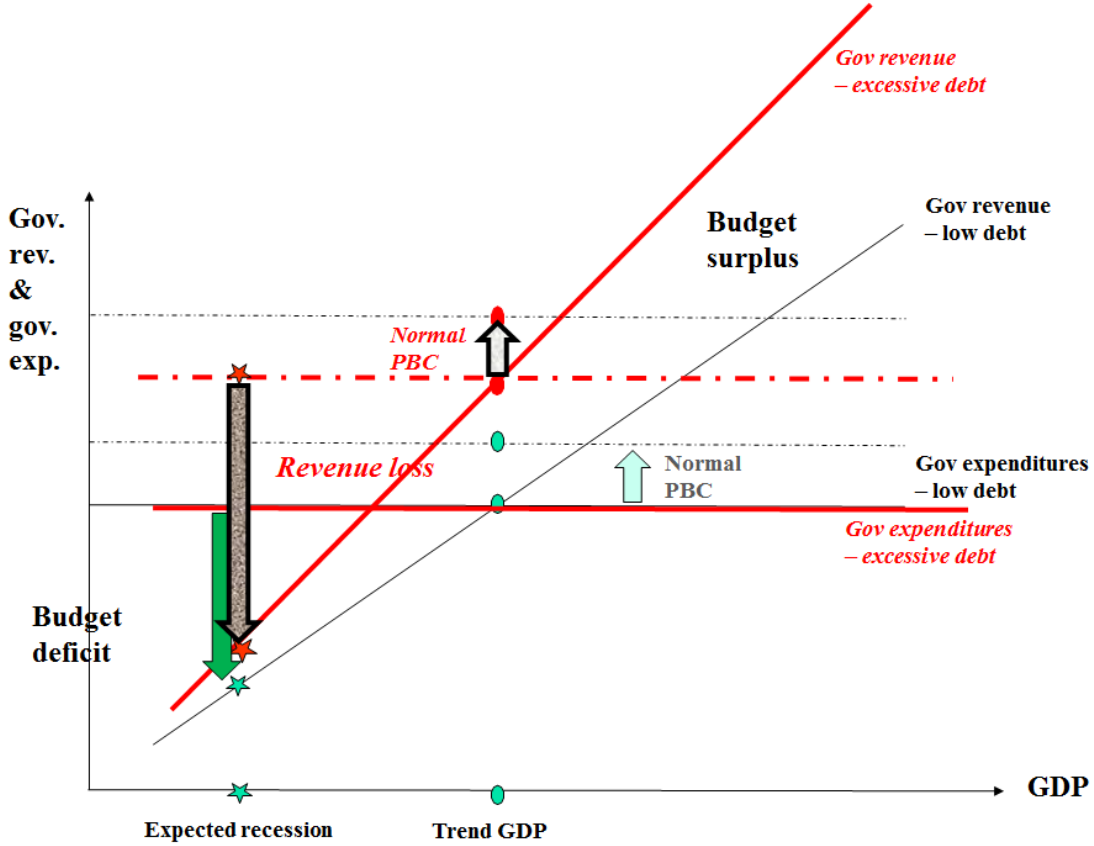


FIGURE II: EXPENDITURE AND REVENUE 2

Proposition 1 can be illustrated in an analogous way. Figure II compares the situation of a low debt and an excessive debt municipality. The low debt municipality is identical to the municipality from Figure I; thin lines and a normal text font are used. Our stylized excessive debt municipality is different in two respects (fat lines and italicized

text [all in red] are used). First, the government revenue line is steeper and above the line for the low debt municipality. Second, at trend output there is a primary surplus which is assumed to be used for debt repayment (for simplicity, we assume there is no debt repayment in the low debt municipality). In normal times, the excessive debt municipality would also experience a "Normal PBC" (light [textured] arrow with thick borders) at trend output. However, the expected revenue shortfall in case of a recession is much larger (dark [textured] arrow with thick borders). In order to appear competent, the no-recession level of manipulated government services must be provided despite the expected recession. Hence an excessive debt municipality must increase the deficit by more than a low debt municipality. The opportunistic countercyclical policy effect is thus larger.⁶

IV DATA, SETTING, AND EMPIRICAL MODEL

This section describes the data, the institutional setting for Portuguese municipalities, and the empirical model.

Data and Regional GDP Growth Forecasts

The model's implication (Proposition 1) that the stock of public debt affects the way in which the government adjusts the primary deficit in response to economic performance (booms or recessions) is tested using data for Portuguese local governments. Municipal finance data was obtained from the Portuguese Directorate General of Local Authorities (DGAL), information regarding the dates of local elections and mayors' characteristics from the Ministry of Internal Affairs, and demographic and economic data from the National Statistics Institute (INE). GDP data is not available at the municipal (NUTS

⁶ Average marginal election effects of total expenditures, discussed in footnote 19, suggest that the opportunistic policy effect might be even larger.

IV)⁷ level. Therefore, we collected data for the lowest disaggregation level available – NUTS III. Since data on municipal debt is only available since 2002, and data on regional GDP is available from 1991 to 2014, our dataset covers the period from 2002 to 2014.

There are no GDP growth rate forecasts at neither the municipal nor the regional levels. National 1-year-ahead forecasts, produced by the Portuguese government, are available in the macroeconomic scenario of the national budget, which is presented to the Portuguese parliament in October, shortly before the municipalities must also draft their budgets for the following year. Since the formula-determined transfers that municipalities receive from the central government are indicated in the national budget, the latter must be taken into account when elaborating the municipal budgets.

Assuming that mayors form their expectations of next year’s GDP growth rates based on the government’s forecast of national real GDP growth,⁸ and information on their regions’ current and past growth rates, we obtain 1-year-ahead forecasts estimating the following ARIMAX(2,0,1), i.e. ARMAX(2,1),⁹ model for the NUTS III GDP growth rates in each region:

$$RegGDP_t = \alpha_0 + \alpha_1 RegGDP_{t-1} + \alpha_2 RegGDP_{t-2} + \alpha_3 NatGDPf_t + \zeta_t + \alpha_4 \zeta_{t-1}, \quad (18)$$

⁷ NUTS is the European Union nomenclature for territorial statistical units. Portugal is subdivided into three NUTS I regions (Mainland, Azores and Madeira), seven NUTS II regions, and 25 NUTS III regions. Each NUTS III region aggregates several municipalities, which correspond to the NUTS IV level. There are 308 municipalities in Portugal, 278 in the mainland and 30 in the archipelagos of Azores (19) and Madeira (11).

⁸ The 1-year-ahead GDP growth forecasts from the IMF’s World Economic Outlook (WEO) are also used in robustness tests.

⁹ Short-run forecasts are commonly generated using ARIMA and ARIMAX models (see Enders, 2004). ARIMA is a univariate time series model which uses autoregressive (AR) and moving average (MA) components of the dependent variable to explain or forecast its behaviour. ARIMAX uses the AR and MA components jointly with a vector X of other explanatory variables. When the dependent variable is not stationary (i.e., it is integrated), it is necessary to take differences of it in the order of integration. The strategy suggested by Box and Jenkins (1976) is used to choose the most appropriate model. Since regional growth rates were found to be stationary, there is no need to take first-differences of the series. The ARMAX(2,1) specification was the one found to be most appropriate for the majority of NUTS III regions.

where $RegGDP_t$ is the real GDP growth rate for the region under scrutiny in year t , $NatGDPf_t$ is the national real GDP growth forecast for year t (obtained from the national budget for year t), and ζ_t is a white noise error term. The predicted values from the estimation of equation (18) for each of the 25 NUTS III regions¹⁰ are used in our empirical analysis as the regional growth forecasts.¹¹

Institutional Setting of Portuguese Municipalities

Municipalities are the second highest government level in mainland Portugal, just below the national government, and the third in the archipelagos of Azores and Madeira, where there are also regional governments. Regardless of their location, all Portuguese municipalities are subject to the same laws and regulations, have the same institutional structure, and have the same responsibilities regarding public service provision: sewage, distribution of water, local transportation and communication, basic schooling, property maintenance, promotion of culture and science, recreation and sports facilities, local health care, social housing, environmental protection, and municipal policing. Regarding the institutional structure, the Town Council (Câmara Municipal) holds the executive power, while the Municipal Assembly holds the deliberative power, approving, among other things, the municipal budgets and plans of activities. The members of both chambers are elected directly by citizens, who vote on closed party or independent lists of candidates. The top candidate of the list receiving most votes for the Town Council becomes the mayor, presides that chamber and plays a leading role in the executive, having substantial power and autonomy.

¹⁰ The results of the estimation of the ARMAX model for each of the 25 Portuguese NUTS III regions are reported in Table E.1.

¹¹ The accuracy of these forecasts for the period considered in the estimations is as follows: mean error (ME) = 0.30, mean absolute error (MAE) = 2.04, root mean squared error (RMSE) = 2.65. For the national forecasts: ME=0.87; MAE=1.37; RMSE=1.68. Larger errors in regional forecasts were expected, since regional growth rates exhibit larger volatility than national growth rates (the standard deviations are, respectively, 1.92 and 3.54). Regarding the correlation between actual and forecasted values, it is 0.66 for regions and 0.67 at the national level. Overall, the accuracy of the regional forecasts generated by the ARMAX models appears to be quite reasonable.

Although the financial regime for local governments grants financial autonomy to municipalities, allowing them to elaborate and approve their own budgets without needing approval from a higher-ranked authority, the large majority of municipalities is highly dependent on grants from the central government or from the European Union (own revenues account, on average, for just one third of total effective revenues). The municipal budget is drafted by the mayor's team, analysed by the Town Council, and finally approved by the Municipal Assembly, in the last quarter of the year prior to the relevant fiscal year (which corresponds to the calendar year). As 79% of the mayors are supported by majorities in both chambers (see Table E.2 in Appendix E), they can easily get their budgets approved. Municipalities are allowed to run budget deficits, but they are subject to limits regarding the stock of municipal debt. The current financial regime (Law n. 73/2013) stipulates that gross debt should not be higher than 1.5 times the average current revenues of the last three years, and a municipality whose debt is above the legal limit is obliged to reduce the excess debt by 10 percent each year (which would correspond to $\delta = 0.9$ in the theoretical model). If gross debt is twice the legal limit, the municipality is forced to submit an adjustment plan to the Municipal Support Fund (Fundo de Apoio Municipal).¹²

Municipal elections were held for the first time in December 1976, following the military coup of 1974 which put an end to 48 years of dictatorship. There were local elections every three years until 1985, and every four years thereafter (in December until 2001, and in October since then). Although national legislative elections sometimes occurred in the same year (at least three months apart though), national, regional, or European

¹² Legal debt limits varied over time, with successive versions of the local finance law. The choice of the limit currently in force is based on an exercise done in 2012 by the Technical Secretariat responsible for drafting the proposal of revision of the Local Finance Law, of which one of the authors was a member. The idea was to determine the level of debt (relative to the level of current revenues) that, if surpassed in the beginning of the 2000s, would lead to clearly excessive debt ten years later. Thus, although this limit was not adopted during our entire sample period, it can nevertheless be used as reference for the definition of excessive debt. As a robustness check, other thresholds will also be used in the empirical analysis.

elections were never concurrent with municipal elections.

Empirical Model

The first result of the theoretical model regarding how the primary deficit responds to expected growth rates (Lemma 1) is tested with the following empirical model:

$$D_{i,t} = \beta_1 ELY_{i,t} + \beta_2 RegGDPf_{i,t} + \beta_3 (ELY * RegGDPf)_{i,t} + \mathbf{X}'_{i,t}\omega + \nu_i + \sigma_t + \xi_{i,t}, \quad (19)$$

where $D_{i,t}$ is the primary budget deficit of municipality i in year t in real euros (of 2015) per capita; $ELY_{i,t}$ is a dummy variable that equals one in municipal election years, and zero otherwise; $RegGDPf_{i,t}$ is the forecast of real GDP growth for year t in the region to which municipality i belongs (estimated using the ARMAX model of equation 18); $\mathbf{X}_{i,t}$ is a vector of control variables which may affect budget balances; ν_i represents unobserved municipality-specific effects; σ_t represents time-specific effects;¹³ and $\xi_{i,t}$ is the error term. The forecasted regional real GDP growth rate, $RegGDPf_{i,t}$ is interacted with $ELY_{i,t}$, so that we can check if the effects of the expectations for economic growth in election years are different from those in the other years of the electoral cycle.¹⁴

Based on the theoretical model and on previous empirical evidence of PBCs in Portuguese municipalities (e.g., Bohn and Veiga, 2017; Aidt, et al., 2011; Veiga and Veiga, 2007), we expect a positive β_1 , consistent with higher budget deficits in election years. Additionally, a negative β_3 is expected, given the model's prediction that expected negative or unusually low growth rates lead to higher deficits, while positive growth rates lead to surpluses. The overall election-year effect on the budget balance is given by $(\beta_1 + \beta_3 * RegGDPf_{i,t})$.

¹³ Since the election-year dummy would be collinear with yearly dummy variables, we control for time effects using 5-year period dummies. In robustness tests, we also use 4-year mandate dummies and a cubic time trend.

¹⁴ A similar model was used in Bohn and Veiga (2017). However, there, the focus was on identifying a countercyclical policy effect in periods with *recessionary* expectations. Several dummies were employed to test the effect of recession expectations on the deficit.

The vector $\mathbf{X}_{i,t}$ includes the following control variables which may affect budget balances: dependency ratio;¹⁵ population density; dummy variables for left-wing and independent mayors; years in office (of the mayor); a dummy variable, *Majority*, which takes the value of one when the mayor is supported by majorities in both the Town Council and the Municipal Assembly, and zero otherwise.

An extended version of the model of equation (19) tests the theoretical model's main prediction that a higher stock of municipal debt exaggerates the government's primary deficit response to expected booms or recessions (Proposition 1). This extended version can be presented as follows:

$$\begin{aligned}
D_{i,t} = & \beta_1 ELY_{i,t} + \beta_2 RegGDPf_{i,t} + \beta_3 ExcessDebt + \beta_4 (ELY * RegGDPf)_{i,t} + \\
& \beta_5 (ELY * ExcessDebt)_{i,t} + \beta_6 (RegGDPf * ExcessDebt)_{i,t} + \\
& \beta_7 (ELY * RegGDPf * ExcessDebt)_{i,t} + \mathbf{X}'_{i,t}\omega + \nu_i + \sigma_t + \xi_{i,t},
\end{aligned} \tag{20}$$

where $ExcessDebt_{i,t}$ is a dummy variable that takes the value of one if the gross debt of municipality i in year t is greater than 1.5 times the average current revenues of the last three years, and equals zero otherwise. The remaining variables are as described above. The models of equations (19) and (20) will be estimated by fixed effects, with standard errors clustered by NUTS III region and year. Descriptive statistics of the variables used in this paper are presented in Appendix E (Table E.2).

V EMPIRICAL RESULTS

Here, we present empirical results to test Lemma 1 and Proposition 1 of the theoretical model; we also discuss an array of robustness tests.

¹⁵ The dependency ratio is the percentage of the population below 15 or above 65 years old. Population and population growth were never statistically significant when included, and sometimes caused problems of collinearity.

Growth Expectations

The results of the estimation of the model of equation (19) for the primary deficit (in real euros per capita), by fixed effects, with standard errors clustered by NUTS III region and year are reported in column 1 of Table II. In order to facilitate the interpretation, the marginal effects of the election year, over the forecasted growth rates, are illustrated in Figure III.¹⁶ As predicted by Lemma 1 of the theoretical model, expected recessions (negative growth forecasts) in election years lead to even higher primary deficits, as local governments will not want to bear the electoral costs of reducing the provision of local public goods in order to compensate for the lower tax revenues. The effect on the deficit is positive and statistically significant, except for 4% positive growth. That is, the primary deficit tends to be higher in election years than in the other years of the political cycle, for practically the entire range of predicted growth rates. This is consistent with the results of previous studies (e.g. Bohn and Veiga, 2017; Aidt, et al., 2011; Veiga and Veiga, 2007) which also found evidence of political budget cycles in Portuguese municipalities.

The coefficient for regional real GDP forecasts is positive, indicating that primary deficits are reduced in non-election years when the economy is expected to slow down. This could be interpreted as precautionary fiscal policy. Note, however, that, as discussed in the next subsection, the coefficient is much reduced and becomes insignificant in the specification of column 3 (where the effect is picked up by the interaction term with excessive debt municipalities). As for the control variables, only the dependency ratio is marginally statistically significant, with a negative sign, indicating – somewhat surprisingly – that greater shares of younger and senior population are associated with lower deficits. However, this also becomes insignificant in the specifications of columns

¹⁶ Since only about one percent of the distribution of forecasted growth rates is below -6%, and only another one percent is above 4%, Figure III only shows the marginal effects for forecasted growth rates within that interval.

TABLE II: COUNTERCYCLICALITY IN PBCs

	(1)	(2)	(3)
Election year	61.968*** (8.752)		62.903*** (8.304)
Real GDP growth forecast (NUTS 3 region)	4.290** (2.482)	5.805** (2.496)	1.166 (0.694)
Election year * Real GDP growth forecast (NUTS 3 region)	-14.569*** (-5.387)	-12.973*** (-3.137)	-7.974** (-2.553)
Excess debt			23.219** (2.557)
Election year * Excess debt			2.732 (0.168)
Excess debt * Real GDP growth forecast (NUTS 3 region)			8.976*** (3.481)
Election year * Excess debt * Real GDP growth forecast (NUTS 3 region)			-17.149*** (-2.937)
Mayor left	-14.473 (-1.262)	-12.727 (-1.125)	-12.258 (-1.073)
Mayor independent	32.816 (1.160)	37.428 (1.332)	34.976 (1.233)
Years mayor	-0.714 (-1.201)	-0.873 (-1.318)	-0.825 (-1.393)
Majority	0.194 (0.017)	1.681 (0.150)	0.477 (0.042)
Dependency ratio	-5.123* (-1.780)	-2.876 (-1.038)	-4.307 (-1.487)
Population density	0.037 (1.030)	0.048 (1.314)	0.035 (1.019)
Election years - Non-election years		52.656*** (7.982)	
Time effects controlled for using:	5-Year Dummies	Yearly Dummies	5-Year Dummies
Number of Observations	4,002	4,002	4,002
R-squared	0.118	0.129	0.124

Notes: Regressions with fixed effects for municipalities and standard errors clustered by NUTS III region and year. T-statistics based on standard errors robust to heteroskedasticity and autocorrelation are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

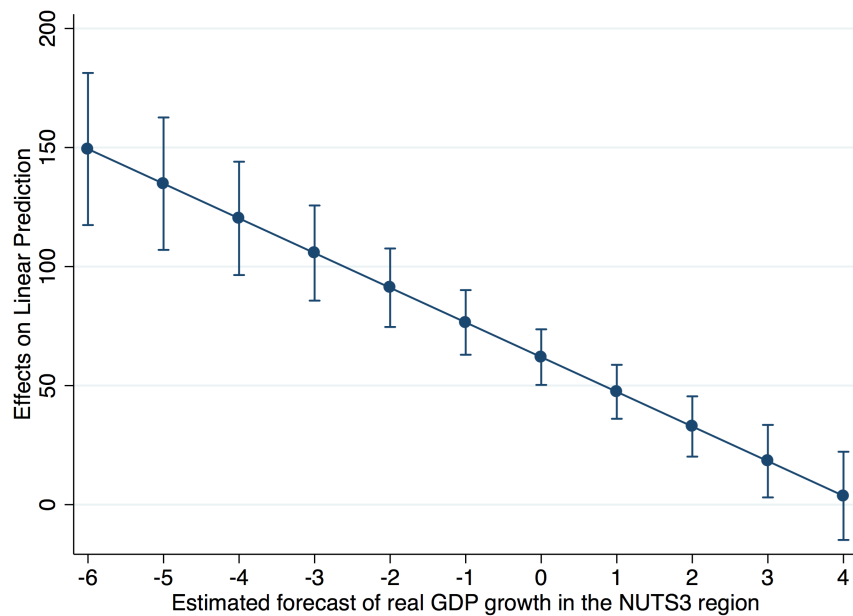


FIGURE III: AVERAGE MARGINAL EFFECTS OF THE ELECTION YEAR

2 and 3 described below.

In column 2 of Table II, we control for time effects with year dummies, instead of 5-year period dummies. This has the drawback of forcing the exclusion of the dummy variable for the election year, but has the advantage of accounting for other events that may have happened in specific election years. In order to economize space, we do not report the coefficients for the year dummies. Instead, we test the hypothesis that the effects for election years are equal to those for non-election years. As shown towards the bottom of the table, the difference between election and non-election year effects is substantial (52.66 euros per capita) and highly statistically significant. Thus, our results are robust to controlling for time in this alternative manner (as well as to mandate dummies as discussed in the subsection on robustness tests further down).

Excessive Debt

The results of the estimation of the model of equation (20), which takes the municipal debt stock into account, are reported in column 3 of Table II. Since the interpretation of

coefficients is not trivial when triple interactions are used, the average marginal effects of the election year are illustrated in Figure IV, for municipalities with and without excessive debt ($ExcessDebt=1$ and $ExcessDebt=0$, respectively),¹⁷ over the forecasted growth rates.

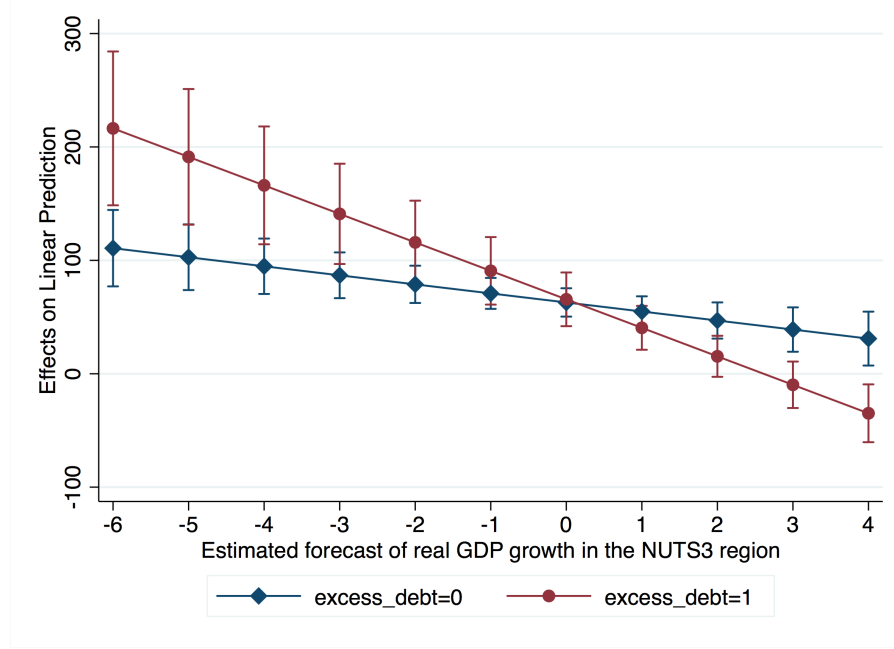


FIGURE IV: AVERAGE MARGINAL EFFECTS OF THE ELECTION YEAR

Both lines are negatively sloped, indicating a negative relationship between deficits and forecasted growth rates, as shown in Figure III. The larger slope of the marginal effects line for municipalities with excessive debt is consistent with the prediction made in Proposition 1 of the theoretical model, namely that, in election years, they are more sensitive to growth expectations than the municipalities whose debt stock is not excessive.¹⁸

¹⁷ The dummy variable *ExcessDebt* takes the value of one if the gross debt of the municipality is above the legal limit of 1.5 times its average current revenues over the previous three years, and equals zero otherwise.

¹⁸ This happens because municipalities with excessive debt tend to have higher tax rates and, therefore, suffer greater revenue losses during recessions than less indebted municipalities. Although we do not have information on municipal tax rates for most of the sample period, and thus cannot test this relationship directly, we show in Table E.3 that, regardless of the time horizon considered, fiscal revenue tends to increase more in high debt municipalities (for which we use two specifications, either debt ratios in the initial period or the excessive debt criterion that is used throughout the paper, also as of the initial period).

That is, in an election year, excessive debt municipalities register relatively higher primary deficits for more negative forecasted growth rates, while they have smaller deficits, or even surpluses, for higher growth rates.¹⁹ Only for expected growth rates between -1% and 1% it is not possible to reject the hypothesis that the primary deficit is the same for both types of municipalities.

The positive sign of the interaction term between excessive debt and the GDP forecast in column 3 of Table II may seem counterintuitive. It does, however, follow the precautionary policy logic discussed in the previous subsection. The positive coefficient means that in an excessive debt municipality a lower deficit is produced in an expected recession during an off-election year. Recession in an excessive debt municipality implies a larger revenue loss (see also Footnote 18). Precautionary behaviour then means extra cautious fiscal policy in an excessive debt municipality.

In order to check for eventual non-linear effects of forecasted regional real GDP growth, we included a squared term in the model of equation (20). As shown in Figure V, the effects are similar to those obtained when accounting only for linear effects of forecasted regional GDP growth; and our conclusions remain essentially the same.

Robustness Tests

The robustness of our main empirical results, shown in column 3 of Table II, was checked in several ways.²⁰ First, we tried two different definitions of excessive debt: debt ratio above 2 (debt stock above twice the average current revenues of the last three years); and debt ratio above its sample median (1.3 times average current revenues of the last three years). The results, shown in Table F.1 of Appendix F are similar to those of Table II,

¹⁹ The graphs of Figure F.1 in the appendix suggest that, in excessive debt municipalities, the higher deficits in election years with stronger recessions are associated with both an increase in expenditures and a fall in fiscal revenues.

²⁰ The robustness tests' results are shown in tables only. Nevertheless, the respective figures are similar to those shown above; they are available from the authors upon request.

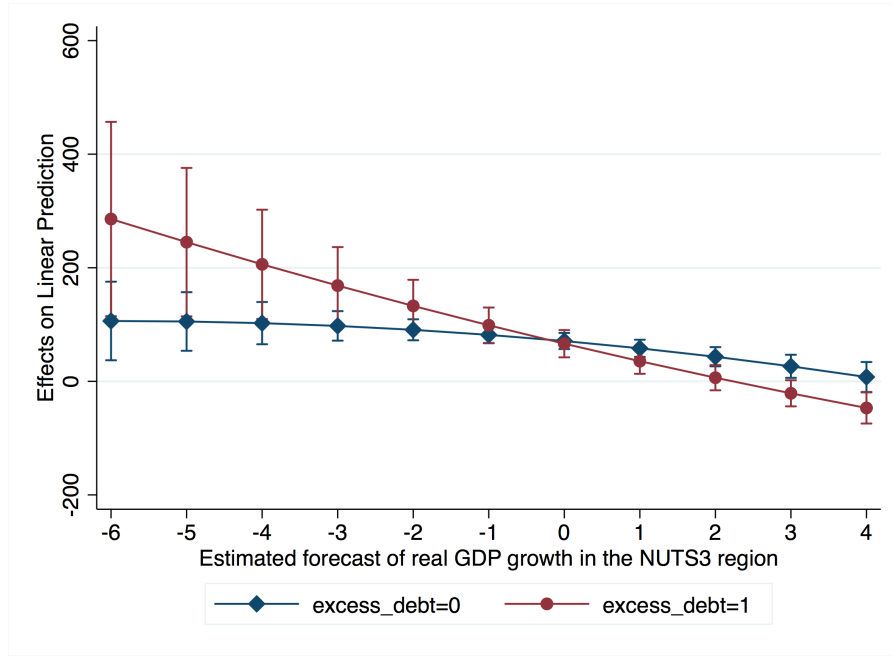


FIGURE V: AVERAGE MARGINAL EFFECTS OF THE ELECTION YEAR (NON-LINEAR GDP GROWTH EFFECTS)

indicating that our results are robust to using alternative definitions of excessive debt.

Second, we checked the robustness of the results to slight specification changes: excluding vector X of control variables; controlling for time effects with 4-year mandate dummies (instead of 5-year period dummies); and clustering standard errors by municipality (instead of by region and year). Then, we checked if results changed when forecasts of national GDP growth rates were used instead of forecasts for growth in NUTS III regions. As shown in Table F.2 in Appendix F, the results remain practically the same as in column 3 of Table II.

Finally, we also checked if the results were sensitive to three sample restrictions: excluding the 30 municipalities of the archipelagos of Azores and Madeira, as they have regional governments; excluding 100 municipalities for which formula-determined grants from the central government are above 50% of total revenues (excluding loans), as these municipalities' revenues are less sensitive to the business cycle than those of local governments

which rely more on own revenues; and, excluding term-limited mayors (in our sample, a total of 160, but only in the term leading to the 2013 elections) as they have smaller incentives to behave opportunistically in election years. Again, the results, reported in Table F.3 of Appendix F, are similar to those of Table II.

VI CONCLUSION

The goal of this paper was to show that it makes sense for policymakers of highly indebted entities (e.g. countries, municipalities) facing an election to raise the primary deficit beyond what policymakers dealing with a lower stock of debt will do, when there is a recession (and vice versa for a boom). When tax rates are higher in high debt entities, the tax revenue shortfall is more significant, but opportunistic policymakers will try to compensate it in order to avoid giving the impression of being incompetent. We obtain robust support from our empirical investigation of Portuguese municipalities that recessions, elections, and high debt form an unholy trinity. This is shown to apply specifically to Portuguese municipalities, but the theoretical model illustrates that the underlying mechanism is more generally relevant.

Our finding is important because high debt entities often face recessions and are thus tempted to manipulate more when there are elections coming up. This may be particularly relevant for high debt countries, because they often face both recessions *and* more frequent elections at the same time. Clear policy conclusions can be drawn from the theoretical mechanism we suggest. Rules and obligations for the government may not help much. Effective deficit and thus debt reduction may only work, if voters can be made fully aware of the (expected) economic conditions; and if their expectations of government expenditures and services can be sufficiently lowered. This reduces the magnitude of the competence pretence game the government has to play.

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The appendix gives indications on the model solution including the derivation of the lemma and proposition. It also presents descriptive statistics and additional empirical results.

A PROBABILITY OF AN INDIVIDUAL TO VOTE FOR THE INCUMBENT

First, we consider an individual who votes in period t for the politician who can deliver the highest level of expected overall utility in $(t+1)$. It consists of utility from consumption, utility from the provision of local public goods, and utility from the ideological alignment with the politician. The individual votes for incumbent a , if

$$\underbrace{E_t[u(c_{t+1}^a) + L_{t+1}^a + \alpha\theta^i(-\frac{1}{2})]}_{\text{exp. utility when } a \text{ in power}} > \underbrace{E_t[u(c_{t+1}^b) + L_{t+1}^b + \alpha\theta^i(+\frac{1}{2})]}_{\text{exp. utility when } b \text{ in power}}. \quad (\text{A.1})$$

Obviously, voters differ in their preference θ^i for party a and b . Expected consumption is identical under both politicians, whereas the expected provision of local public goods is affected by the policymakers' competence η_{t+1}^j and individuals' expectations thereof:

$$E_t^i[u(c_{t+1}^a)] = E_t^i[u(c_{t+1}^b)] = E_t^i[u((1-\tau)\epsilon_{t+1})]; \quad (\text{A.2})$$

$$E_t^i[L_{t+1}^j] = E_t^i[\tau_t\epsilon_{t+1} - D_{t+1} + \eta_{t+1}^j]; \quad j = a, b; \quad (\text{A.3})$$

$$E_t^i[D_{t+1}] = E_t^i[D_{t+1}^a] = E_t^i[D_{t+1}^b]. \quad (\text{A.4})$$

Equation (A.3) says that voters base their expectation of the provision of local public goods in period $(t+1)$ on their belief of the tax revenue in $(t+1)$ on the one hand and the deficit making and competence attributed to the government in power in $(t+1)$ on the other hand. Deficit in $(t+1)$ is the same under either government, since each one wants to repay as much as possible of debt (left by incumbent a) above the debt target in year $(t+1)$. The reason is that there is no election at the end of that period and each government wants to start with a clean slate into the next election year $(t+2)$. See

also footnote 5. As for the skills shock, individuals have no idea about either potential policymaker's skills in $(t + 1)$. Nor do they know the skills shock of the challenger in period t , and, therefore, expect 0. However, they can use the incumbent's period t fiscal policy to draw conclusions about her skills shock in period t . The expected level of local public goods of the challenger differs from what is known of the incumbent:

$$E_t[L_{t+1}^b] = E_t[\tau_t \epsilon_{t+1} - D_{t+1}]; \quad (\text{A.5})$$

$$E_t[L_{t+1}^a] = E_t[\tau_t \epsilon_{t+1} - D_{t+1}] + E_t[\mu_t^a]. \quad (\text{A.6})$$

Combining equations (A.1) to (A.6) we can obtain a condition for an individual to vote for incumbent a (which corresponds to condition (11) in the main text):

$$E_t[\mu_t^a] > \alpha \theta^i. \quad (\text{A.7})$$

Using the distribution of the skills shock we can determine the probability (Pr) of any voter to vote for incumbent a :

$$Pr[E_t[\mu_t^a] - \alpha \theta^i \geq 0] = \frac{E_t[\mu_t^a] - (-\alpha)}{\alpha - (-\alpha)} = \frac{E_t[\mu_t^a]}{2\alpha} + \frac{1}{2}. \quad (\text{A.8})$$

B PROBABILITY OF THE INCUMBENT TO WIN

Now, we can determine the probability $Prob$ that incumbent a obtains 50% of the votes in the period t elections. It is the probability that mass 1 of voters, i.e. all voters times their individual probability Pr to vote for incumbent a (as determined in equation A.8) is greater or equal to $\frac{1}{2}$. The probability for the incumbent to win the election – equation (12) in the main text – is repeated here:

$$\text{Prob} \left\{ \left[\frac{E_t[\mu_t^a]}{2\alpha} + \frac{1}{2} \right] \geq \frac{1}{2} \right\} \quad (\text{B.1})$$

Competence extraction mechanism: Voters' expectation of government competence μ_t^a can be obtained by studying the voters' perception of the government budget constraint (9) from the main text which is repeated here:

$$L_t = \tau_t \epsilon_t + D_t + \mu_t^a + \mu_{t-1}^a. \quad (\text{B.2})$$

The true competence is:

$$\mu_t^a = L_t - \tau_t \epsilon_t - D_t - \mu_{t-1}^a. \quad (\text{B.3})$$

Voters can observe the level of local public goods L_t , previous period competence μ_{t-1}^a , and the tax rate τ_t . Their perception of government competence is, however, also affected by their expectation of growth and the government deficit policy (which can be concealed, for instance, by using special government funds and accounting tricks). Hence we obtain what corresponds to equation (14) in the main text:

$$\begin{aligned} E_t[\mu_t^a] = \widehat{\mu}_t^a &= L_t - \tau_t \widehat{\epsilon}_t - \widehat{D}_t - \mu_{t-1}^a \\ &= \underbrace{L_t - \tau_t \epsilon_t - D_t - \mu_{t-1}^a}_{\mu_t^a \text{ from (13) or (B.3)}} + [\tau_t(\epsilon_t - \widehat{\epsilon}_t)] + [D_t - \widehat{D}_t]; \\ E_t[\mu_t^a] = \widehat{\mu}_t^a &= \mu_t^a + [\tau_t(\epsilon_t - \widehat{\epsilon}_t)] + [D_t - \widehat{D}_t]. \end{aligned} \quad (\text{B.4})$$

Hence the incumbents' probability of winning becomes (equation 15 in the main text):

$$\begin{aligned} \text{Prob}^{win} &= \text{Prob} \left\{ \left[\frac{\mu_t^a + [\tau_t(\epsilon_t - \widehat{\epsilon}_t)] + [D_t - \widehat{D}_t]}{2\alpha} + \frac{1}{2} \right] \geq \frac{1}{2} \right\} \\ &= \text{Prob} \left\{ \mu_t^a \geq [\tau_t(\widehat{\epsilon}_t - \epsilon_t)] + [\widehat{D}_t - D_t] \right\} \end{aligned} \quad (\text{B.5})$$

$$= 1 - F[\tau_t(\widehat{\epsilon}_t - \epsilon_t) + \widehat{D}_t - D_t], \quad (\text{B.6})$$

where $F(\bullet)$ is the distribution function of the skills shock.



FIGURE B.1: BELL-SHAPED COMPETENCE DENSITY FUNCTION AS AN EXAMPLE

The marked area towards the right (light grey or yellow [if in colour]) under the density function depicted in Figure B.1 corresponds to the probability described by equation

(B.5) and by the distribution function representation in equation (B.6). Consider a recession which is underestimated by voters. Then, the expected competence overall can be greater than actual competence only if the government's deficit makes up for the voters' underestimation of the shortfall in tax revenue ($\tau_t(\widehat{\epsilon}_t - \epsilon_t) < 0$), plus the voters' expected deficit \widehat{D}_t . Then the probability (see equation (B.6) or the light grey [or yellow] area under the density function) is always greater than $\frac{1}{2}$ and the government's chance to be re-elected is increased. The competence perception of voters would also be increased, if voters fully knew of and believed in the (forecasted) recession and the government increased the deficit beyond what voters expect. However, if voters could rationally foresee the recession *and* the deficit manipulation by the government, then the manipulation would turn out to be ineffective at the equilibrium.

Using equation (7) we can relate period t deficit to the $(t - 1)$ debt level:

$$D_t = (\delta - (1 + r))B_{t-1}^* + D_t^{free}. \quad (\text{B.7})$$

The winning probability becomes:

$$\text{Prob}^{win} = 1 - F[\tau_t(\widehat{\epsilon}_t - \epsilon_t) + \widehat{D}_t - (\delta - (1 + r))B_{t-1}^* + D_t^{free}]. \quad (\text{B.8})$$

C THE INCUMBENT'S MAXIMISATION PROBLEM

Prior to elections, incumbent a would like to maximise her utility over periods t and $(t + 1)$ by determining D_t (see the timing of events on page 9). She can, however, only decide on the free component of the deficit D_t^{free} . Period $(t + 1)$ utility is the sum of the utilities for winning and losing the election weighted by the just determined probability. (X_s is kept constant and discount factor β is set to 1 because it is irrelevant for the qualitative properties of the results.) Hence, incumbent a 's decision problem:

$$\begin{aligned} \max_{D_t^{free}} V &= \max_{D_t^{free}} V_t^a = \max_{D_t^{free}} W_t^a + W_{t+1}^a \\ &= \max_{D_t^{free}} E_t^a \{ u((1 - \tau)\epsilon_t) + L_t + X \} \\ &\quad + E_t^a \{ \text{Prob}^{win} [u((1 - \tau)\epsilon_{t+1}) + L_{t+1} + X - (B_t^* - B_t)^2] \} \\ &\quad + E_t^a \{ (1 - \text{Prob}^{win}) [u((1 - \tau)\epsilon_{t+1}) + L_{t+1}] \} \end{aligned} \quad (\text{C.1})$$

$$\begin{aligned}
&= \max_{D_t^{free}} u((1-\tau)\epsilon_t) + L_t + X \\
&\quad + u((1-\tau)\epsilon_{t+1}) + L_{t+1} + \text{Prob}^{win} [X - (\delta B_{t-1}^* - B_t)^2]. \tag{C.2}
\end{aligned}$$

where

$$\begin{aligned}
L_t &= \tau\epsilon_t + D_t + \eta_t^j; \\
L_{t+1} &= \tau\epsilon_{t+1} + D_{t+1} + \eta_{t+1}^j; \\
D_t &= (\delta - (1+r))B_{t-1}^* + D_t^{free}; \\
D_{t+1} &= B_{t+1} - (1+r)B_t \\
&= B_{t+1} - (1+r)[(1+r)B_{t-1} + D_t] \\
&= B_{t+1}^* - (1+r)^2 B_{t-1} - (1+r)D_t \quad [\text{government goes for lower limit, footnote 5}] \\
&= \delta^2 B_{t-1}^* - (1+r)^2 B_{t-1}^* - (1+r)D_t \quad [\text{use equation (5)}] \\
&= (\delta^2 - (1+r)^2)B_{t-1}^* - (1+r)D_t.
\end{aligned}$$

The first order condition (FOC) is:

$$\begin{aligned}
V_{D_t^{free}} &= \frac{dV}{dD_t^{free}} = 1 - (1+r_t) + F'[\tau(\widehat{\epsilon}_t - \epsilon_t) + \widehat{D}_t - (\delta - (1+r))B_{t-1}^* + D_t^{free}] \\
&\quad [X - (\delta B_{t-1}^* - B_t)^2] = 0; \\
\Leftrightarrow \quad r_t &= F'[\bullet] [X - (\delta B_{t-1}^* - B_t)^2]. \tag{C.3}
\end{aligned}$$

The second order condition for a well-behaved maximisation problem is satisfied.²¹ So the FOC determines the government's optimal deficit D_t^{free*} .

²¹ $V_{D_s^{free} D_s^{free}} = -F''[\bullet] [X - (B_t^* - B_t)^2] < 0$. The manipulation pushes the critical value of the F function below mean 0, so that $F''[\bullet] > 0$. Then the sufficient condition $X > (B_t^* - B_t)^2$ must, obviously, be satisfied for a maximising government because winning the elections only makes sense when the ego rent is not totally eaten up by the reputation loss.

D PERTURBATION RESULTS

The Implicit Function Theorem is used for obtaining perturbation results. Derivatives with respect to any variable x of the FOC around the optimal value D_t^{free*} will be denoted $\frac{d \frac{dV}{dD_t^{free}}|_{D_t^{free*}}}{dx} =: V_{D_t^{free}x}$. The derivations of the marginal effect of changes in exogenous variables *on* the equilibrium value of the government's optimal choice of deficit D_t^{free*} are specified below.

For Lemma 1:

$$\begin{aligned} \frac{dD_t^{free*}}{d\epsilon_t} &= -\frac{V_{D_t^{free}\epsilon_t}}{V_{D_t^{free}D_t^{free}}} \\ &= -\frac{-F''[\bullet] [\tau(B_{t-1}^*)\epsilon_t] [X - (\delta B_{t-1}^* - B_t)^2]}{-F''[\bullet] [X - (\delta B_{t-1}^* - B_t)^2]} = -\tau(B_{t-1}^*)\epsilon_t < 0. \end{aligned} \quad (D.1)$$

$$\frac{dD_t}{d\epsilon_t} = \frac{d[(\delta - (1+r))B_{t-1}^*]}{d\epsilon_t} + \frac{dD_t^{free*}}{d\epsilon_t} = 0 - \tau(B_{t-1}^*)\epsilon_t < 0. \quad (D.2)$$

For Proposition 1:

$$\frac{d \frac{dD_t}{d\epsilon_t}}{dB_{t-1}^*} = -\tau'(B_{t-1}^*)\epsilon_t < 0. \quad (D.3)$$

E PRELIMINARY RESULTS ON THE EMPIRICAL MODEL AND DESCRIPTIVE STATISTICS

This subsection presents the results of the ARMAX models for the NUTS III regions, of descriptive statistics, and of estimations for the relation between initial debt and growth in fiscal revenues.

TABLE E.1: ARMAX ESTIMATION RESULTS

Region	National Forecast of GDP growth	AR(1)	AR(2)	MA(1)	Obs.	Log likelihood	P-value
Alto Minho	1.004***	-0.170	-0.228	0.049	23	-56.27	0.000
Cávado	1.336***	0.338	0.148	-0.103	23	-53.31	0.000
Ave	0.983***	-0.021	0.179		23	-53.40	0.002
Área Metropolitana do Porto	1.569***	0.940***	-0.137	-1.000***	23	-51.38	0.000
Alto Tâmega	0.996***	0.424*	-0.112	-1.000***	23	-52.65	0.000
Tâmega e Sousa	1.569***	0.318	-0.177	-1.000***	23	-55.81	0.000
Douro	0.735**	-1.160***	-0.686***	1.000***	23	-56.52	0.012
Terras de Trás-os-Montes	1.409***	-0.091	-0.269		23	-55.80	0.008
Oeste	1.534***	-0.446	-0.215	0.529*	23	-53.30	0.000
Região de Aveiro	1.418***	-0.148	0.042		23	-53.26	0.000
Região de Coimbra	1.701***	-0.240	-0.094	-0.056	23	-53.38	0.000
Região de Leiria	1.715***	0.600***	0.204	-1.000***	23	-54.75	0.000
Viseu Dão Lafões	1.769***	0.473***	-0.253	-1.000***	23	-55.90	0.000
Beira Baixa	1.047***	0.820***	-0.157	-1.000***	23	-60.68	0.000
Médio Tejo	1.448***	-0.330	-0.361*	0.417***	23	-54.70	0.000
Beiras e Serra da Estrela	1.391***	0.425**	-0.279	-1.000***	23	-50.55	0.000
Área Metropolitana de Lisboa	2.042***	1.135***	-0.369*	-1.000***	23	-59.81	0.000
Alentejo Litoral	2.657***	0.717***	-0.157	-1.000***	23	-72.71	0.000
Baixo Alentejo	1.670***	0.395*	-0.137	-1.000***	23	-65.50	0.000
Lezíria do Tejo	1.563***	0.735***	-0.406	-1.000***	23	-68.36	0.000
Alto Alentejo	1.129***	1.022***	-0.660***	-1.000***	23	-53.50	0.000
Alentejo Central	1.253***	1.087***	-0.301	-1.000***	23	-56.92	0.000
Algarve	2.311***	0.758***	-0.400**	-1.000***	23	-49.56	0.000
Região Autónoma dos Açores	2.150***	0.483***	-0.520***	-1.000***	23	-43.41	0.000
Região Autónoma da Madeira	3.423***	0.622***	0.122	-1.000***	23	-74.13	0.000

Notes: ARMAX(2,1) estimations for each region, except for three for which this specification did not converge, and an ARMAX(2,0) was used instead. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE E.2: DESCRIPTIVE STATISTICS

VARIABLES	Observations	Mean	St.Dev.	Min.	Max.
Primary deficit (real euros per capita)	4,002	-6.05	166.84	-745.00	3,616.92
Election year	4,002	0.23	0.42	0.00	1.00
GDP Forecast (regional)	4,002	0.31	2.34	-9.46	6.61
Dependency ratio	4,002	35.65	4.18	26.43	51.83
Population density	4,002	297.49	817.42	4.41	7,530.69
Mayor left	4,002	0.49	0.50	0.00	1.00
Mayor independent	4,002	0.02	0.14	0.00	1.00
Years mayor	4,002	8.96	7.01	1.00	37.00
Majority	4,002	0.79	0.41	0.00	1.00
Debt ratio (Gross debt over average current revenues)	4,002	1.58	1.16	0.00	11.49
Excess debt (Debt ratio > 1.5)	4,002	0.42	0.49	0.00	1.00
Excess debt 2 (Debt ratio > 2)	4,002	0.27	0.44	0.00	1.00
Excess debt 3 (Debt ratio > Median debt ratio (1.3))	4,002	0.50	0.50	0.00	1.00

Sources: DGAL, Ministry of Finance, Ministry of Internal Affairs, and INE.

TABLE E.3: GROWTH IN FISCAL REVENUES EXPLAINED BY INITIAL DEBT

VARIABLES	(1) 1 year	(2) 1 year	(3) 2 years	(4) 2 years	(5) 3 years	(6) 3 years	(7) 4 years	(8) 4 years
Debt ratio (initial)	0.023** (2.081)		0.016*** (2.680)		0.012** (2.313)		0.011** (2.141)	
Excessive debt dummy (initial)		3.853* (1.961)		1.975* (1.909)		1.995** (2.172)		1.986** (2.021)
Regional GDP growth (average)	0.417* (1.701)	0.401* (1.650)	0.499** (1.998)	0.489* (1.961)	1.230*** (3.116)	1.213*** (3.101)	1.433*** (3.205)	1.418*** (3.200)
Population growth (average)	-0.854*** (-6.487)	-0.864*** (-6.521)	-0.845*** (-6.239)	-0.855*** (-6.350)	-1.262*** (-7.294)	-1.269*** (-7.377)	-1.351*** (-5.456)	-1.353*** (-5.479)
Mayor left (average)	3.130 (1.292)	3.270 (1.324)	2.675 (1.649)	2.761* (1.684)	1.423 (1.292)	1.481 (1.342)	0.304 (0.240)	0.337 (0.266)
Majority (average)	0.090 (0.103)	0.038 (0.044)	0.865 (0.857)	0.804 (0.801)	0.484 (0.494)	0.390 (0.397)	0.626 (0.572)	0.517 (0.467)
Observations	3,696	3,696	3,388	3,388	3,080	3,080	2,772	2,772
R-squared	0.078	0.077	0.174	0.171	0.202	0.201	0.238	0.236

Notes: The dependent variable is the annual average growth rate of fiscal revenues over the time horizon indicated at the top of each column. Regressions with fixed effects for municipalities and years. T-statistics based on standard errors robust to heteroskedasticity and autocorrelation, clustered by municipality, are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The time horizon considered for the initial values and the averages in each estimation is indicated in the title of the respective column.

F ADDITIONAL RESULTS AND ROBUSTNESS AND SENSITIVITY TESTS

This subsection presents the average marginal effects of the election year on the primary deficit when performing estimations for total expenditures and for fiscal revenues, the results obtained when using alternative definitions of excessive debt, and those of robustness tests and of the sensitivity analysis.

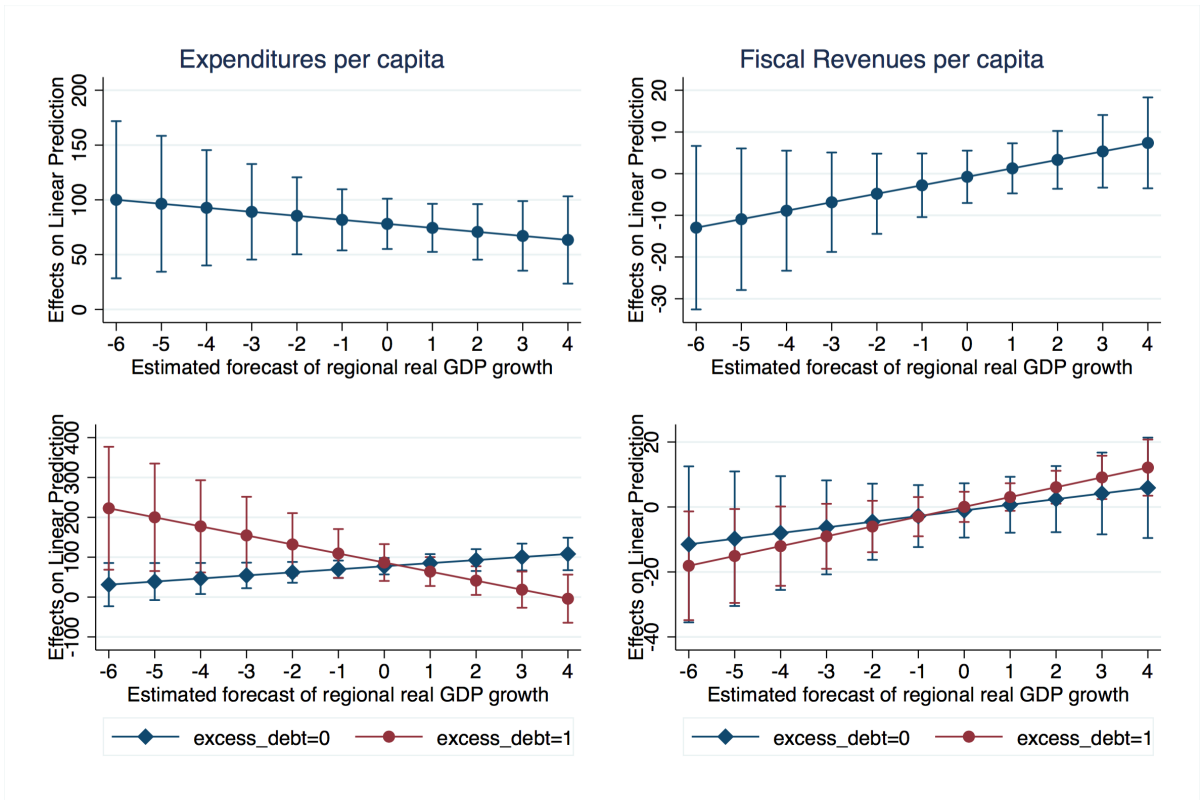


FIGURE F.1: AVERAGE MARGINAL EFFECTS OF THE ELECTION YEAR -
EXPENDITURES AND FISCAL REVENUES

TABLE F.1: ALTERNATIVE DEFINITIONS OF EXCESSIVE DEBT

VARIABLES	(1)	(3)
	Excess debt 2 Debt ratio>2	Excess debt 3 Debt ratio>median(Debt ratio)
Election year	64.822*** (9.672)	64.418*** (7.679)
Real GDP growth forecast (NUTS 3 region)	2.048 (1.205)	0.668 (0.416)
Election year * Real GDP growth forecast (NUTS 3 region)	-10.042*** (-3.650)	-7.601** (-2.209)
Excess debt	27.557*** (2.702)	21.235** (2.425)
Election year * Excess debt	-6.050 (-0.283)	-2.676 (-0.180)
Excess debt * Real GDP growth forecast (NUTS 3 region)	10.661*** (3.251)	8.619*** (3.775)
Election year * Excess debt * Real GDP growth forecast (NUTS 3 region)	-18.430** (-2.467)	-14.470*** (-2.656)
Mayor left	-12.853 (-1.128)	-12.486 (-1.094)
Mayor independent	32.899 (1.164)	34.568 (1.212)
Years mayor	-0.864 (-1.472)	-0.792 (-1.336)
Majority	-0.285 (-0.025)	0.265 (0.023)
Dependency ratio	-4.896* (-1.718)	-4.526 (-1.560)
Population density	0.039 (1.021)	0.028 (0.786)
Observations	4,002	4,002
R-squared	0.124	0.123

Notes: Regressions with fixed effects for municipalities, 5-year period dummies, and standard errors clustered by NUTS III region and year. The definition of excessive debt used in each estimation is indicated at the top of the respective column. T-statistics based on standard errors robust to heteroskedasticity and autocorrelation are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE F.2: ROBUSTNESS TESTS

VARIABLES	(1) Excluding Vector X	(2) 4-Year Dummies	(3) Clustering by municipality	(4) National forecasts
Election year	61.367*** (8.688)	45.846*** (5.819)	62.903*** (8.569)	63.297*** (8.998)
Real GDP growth forecast (NUTS 3 region)	24.899*** (2.805)	25.548*** (2.716)	23.219** (2.574)	5.705 (0.531)
Election year * Real GDP growth forecast (NUTS 3 region)	3.419 (0.210)	8.014 (0.491)	2.732 (0.149)	20.214 (0.897)
Excess debt	1.730 (1.119)	4.902*** (3.244)	1.166 (0.734)	-3.725 (-0.807)
Election year * Excess debt	-8.128*** (-2.623)	-7.479** (-2.331)	-7.974** (-2.284)	-6.473 (-1.229)
Excess debt * Real GDP growth forecast (NUTS 3 region)	8.936*** (3.427)	7.957*** (3.099)	8.976*** (3.734)	22.111*** (4.015)
Election year * Excess debt * Real GDP growth forecast (NUTS 3 region)	-17.241*** (-2.959)	-17.438*** (-2.968)	-17.149*** (-2.717)	-37.701*** (-3.033)
Mayor left		-4.919 (-1.559)	-4.307 (-1.637)	-4.108 (-1.494)
Mayor independent		0.045 (1.295)	0.035 (1.102)	0.029 (1.032)
Years mayor		-10.570 (-0.908)	-12.258 (-1.127)	-10.667 (-0.978)
Majority		40.526 (1.406)	34.976 (1.229)	37.948 (1.348)
Dependency ratio		-1.019 (-1.531)	-0.825 (-1.307)	-1.065 (-1.618)
Population density		2.697 (0.239)	0.477 (0.048)	0.715 (0.073)
Observations	4,002	4,002	4,002	4,002
R-squared	0.121	0.122	0.124	0.122

Notes: Regressions with fixed effects for municipalities, 5-year period dummies (columns 1 and 3), and standard errors clustered by NUTS III region and year in columns 1 and 3, and by municipality in column 3. Excessive debt is defined as in Table II. T-statistics based on standard errors robust to heteroskedasticity and autocorrelation are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE F.3: SENSITIVITY ANALYSIS

VARIABLES	(1) Excluding Azores and Madeira	(2) Excluding formula grants > 50% TotRev	(3) Excluding term-limited mayors
Election year	64.939*** (8.645)	44.821*** (5.653)	65.663*** (6.953)
Real GDP growth forecast (NUTS 3 region)	1.086 (0.666)	3.118* (1.924)	2.329 (1.172)
Election year * Real GDP growth forecast (NUTS 3 region)	-6.807** (-2.234)	-11.738*** (-3.319)	-8.569** (-2.090)
Excess debt	22.991** (2.402)	24.115** (2.473)	20.509*** (2.661)
Election year * Excess debt	4.991 (0.286)	6.973 (0.394)	1.033 (0.058)
Excess debt * Real GDP growth forecast (NUTS 3 region)	7.605** (2.512)	7.201*** (2.750)	6.201** (2.163)
Election year * Excess debt * Real GDP growth forecast (NUTS 3 region)	-20.011*** (-3.077)	-11.893* (-1.869)	-15.341** (-2.305)
Mayor left	-4.119 (-0.338)	-27.101** (-2.050)	-9.012 (-0.809)
Mayor independent	43.817 (1.540)	-21.768 (-0.994)	44.870 (1.321)
Years mayor	-1.124* (-1.895)	-0.153 (-0.262)	-1.528* (-1.941)
Majority	-0.588 (-0.052)	9.528 (0.849)	-5.936 (-0.563)
Dependency ratio	-5.187* (-1.689)	3.196 (0.960)	-1.959 (-0.589)
Population density	0.030 (0.900)	0.038 (1.105)	0.026 (0.667)
Observations	3,612	2,704	3,349
R-squared	0.122	0.120	0.147

Notes: Regressions with fixed effects for municipalities, 5-year period dummies, and standard errors clustered by NUTS III region and year. Excessive debt is defined as in Table II. T-statistics based on standard errors robust to heteroskedasticity and autocorrelation are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.